

2010

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## Recommended Citation

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# HOW TO DISPLAY BRANDED AND NON-BRANDED PRODUCTS IN THE ONLINE SHOPPING WEBSITE

*Completed Research Paper*

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## **Abstract**

*Comparison-Shopping websites (e.g. MySimon.com) help consumers to select and compare products in the online shopping process. The influence of these information-aggregating intermediaries on consumer decision-making has been a focal interest in Information Systems area. In this research, we argue that it is alternatives set composition (i.e., the list of branded and non-branded products) rather than alternatives set size that affects consumer choice behavior. We conducted a series of experiments to investigate the impact of alternatives set size and alternatives set composition on consumers' decisions. Our findings provide much support to our proposition that as the proportion of branded products increases, decision-makers are more likely to be not inclined to make a choice. However, in the event that buyers do make a purchase, they are more likely to choose a non-branded product. Implications for future research and practice will be discussed.*

**Keywords:** Information Presentation, Decision-Making, Brand Context, Cognition

## Introduction

Consumers often compare and shop on Comparison-Shopping websites (e.g., MySimon.com). In order to help consumers in making good decisions, Comparison-Shopping websites provide decision aid systems for consumers to select and winnow their suitable alternatives. These websites serve to enhance the consumer experience not merely by assisting consumers to bypass the long lists of products and their prices and features, but also in presenting the consumers with the best set of alternatives that suit their specifications (Hess et al. 2005; Redmond 2002). However, there is a dearth of research on what and how to display a product in the Comparison-Shopping websites. There are several reasons contributing to this shortfall. First, there is a dichotomous fashioning of the results of the alternatives set size and the choice performance. Prior researches dictated that having more choice is better than less (Brehem 1972). On the other hand, however, some researches contested that increasing the alternatives set size may have adverse effects on consumer decision-making (Iyengar et al. 2000). Decision-makers are likely to suffer from cognitive overload and confusion when processing the various alternatives. Second, how the conditions in which the presentation of products are made and the degree to which they are made would influence the consumer decision, remain relatively fuzzy (Chakravarti et al. 2006; East et al. 2008; Kleinmuntz et al. 1993). Moreover, prior literature has mainly focused on the impact of decision aids on decision performance (Haubl et al. 2000) and preference construction, the design of the decision tools (Tan 2003), and the influence of consumer knowledge and product complexity on Comparison-Shopping website impact, on consumer behavior.

When faced with difficult decisions, consumers often opt for choice avoidance—a tendency to avoid making a choice by postponing it or by seeking a less painful way out (Anderson 2003). Such delay or avoidance of a decision can be unjustified if the options available are favorable for a purchase to be made (e.g., the presence of product options that yield positive consumer surplus). Still, consumers often persist in seeking default no-action, judging from the high rate of online shopping cart abandonment (Sismeiro et al. 2004). The severities of information overload and decision difficulty have been empirically demonstrated by prior researches. However, most of these researches have chosen to focus on demonstrating the adverse effects of a large alternatives set on consumer choice without explicit consideration of the option combinations. In other words, alternatives set quality and alternatives set assortment are less considered. Moreover, relatively little research effort has been devoted to examining the impact of product presentation strategies on the alternative selection process. In this light, a proper understanding of the influence of information presentation on consumer choice is important.

In this study, we aim to investigate the impact of different types of branded and non-branded product presentation strategies and different quantities of alternative sets (large and small) on consumers' procurement decision behavior. We conceive that the branded and non-branded product composition, which represents our presentation strategy, will have a significant impact on the consumers' procurement decision behavior. Some implications for future research and practice will be discussed.

## Literature Review

### *Alternatives Set and Cognitive Load*

Cognitive load is a double-edged sword. From one perspective, a larger alternative set is preferred as it allows for a better match between the consumer's preference and various characteristics of the alternatives (Lancaster 1990). Kahn, Moore and Glazer (1987) highlighted that consumers may experience positive utility from just having multiple items in the alternatives set, which is consistent with the view that a larger assortment may influence preferences by creating a perception of freedom of choice (Brehem 1972). In addition, a larger context also reduces the uncertainty of whether the alternative set at hand has adequately represented all the alternatives that are available (Chernev 2003).

While the offering of more choices represents an opportunity for a better match between an individual's preferences and the nature of the alternatives in the alternative set, contesting arguments and empirical evidence dictates that a larger alternative set can present a decision-maker with the predicament of information overload (Iyengar et al. 2000). Human beings suffer from bounded cognitive capacity in processing information and a larger alternative set would suggest that extra effort is required to evaluate the alternatives. To this end, a consumer may experience emotional difficulty in addition to cognitive difficulty. When a decision-maker experiences difficulty in decision-

making (Anderson 2003), she is very likely to use simplifying heuristics (e.g., satisfying) that make her selective in the use of available information (Tetlock et al. 1996). They include leaving decisions to others, searching for new alternatives, choosing the default alternative or simply opting not to make any choice (Dhar 1997; Browne et al. 2007). In doing so, it is implicitly assumed that consumers have readily available preferences and that their focused task is to find the alternative that best matches their preferences. Yet, consumers often make choices in areas where they do not have well constructed preferences (Payne et al. 1993). In such cases, they are highly likely to construct or modify their preferences based on information available, in order to evaluate the alternatives in the alternative set.

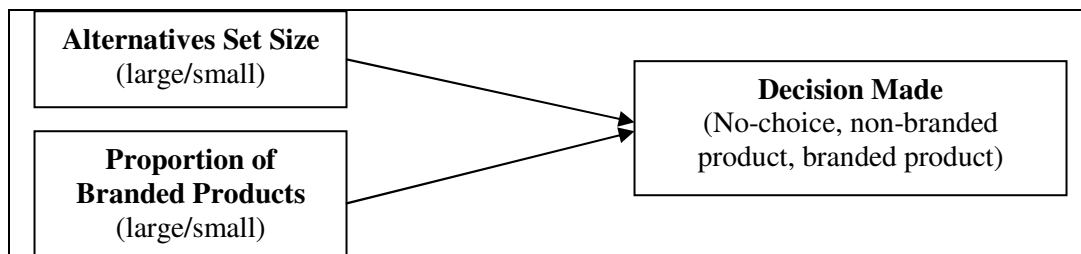
### ***Information Display Strategy and Branded Product***

The influence of the information display strategy is best summarized by Kleinmuntz and Schkade (1993) who suggested that improvements in decision-making can be made by evaluating and changing the environment in which consumers interact. According to Tversky and Shafir (1992), the addition (or removal) of an alternative to the alternative set can influence consumer choice by making the decision harder or easier to justify, due to the degree of conflict generated by the alternative set. Specifically, the availability of competing alternatives of comparable attractiveness can create cognitive and emotional difficulties because it fails to present an instantaneous reason to accept a particular alternative. What this research implies is that when a consumer faces multiple alternatives of comparable quality, that consumer would suffer from decision difficulty and would therefore decrease the likelihood of purchase among the alternatives. In this light, it is plausible that when multiple alternatives are of similar quality, consumers may simplify the comparison by focusing on subsets of the attributes.

Within the research on the comparison of the alternatives, brand is often examined. Brands can be seen as visible, symbolic expressions of the competitive economy (Bogart et al. 1973). This leads to an implicit understanding that brands will not exist if not for the presence of competition among products. Both Sullivan (1998) and Kotler (1997) also posit that brands exist to identify the source of the product as well to distinguish them from those of competitors. Furthermore, Olson (1976) shed light on the mechanism employed by describing a brand name as being frequently used by a consumer as an “information chunk” representing a composition of information about several attributes of a product, such as price, size, shape, manufacturer and performance factors. In this light, brand is often used as a surrogate attribute of quality (Sullivan 1998). In recent years, brand has become more important to consumers while they are making purchase decisions. For instance, Degeratu, Rangaswamy and Wu (2000) observed that in some product categories, brand plays a more important role in the online shopping context as compared to the traditional shopping environment. In addition, increased perceived risk of transaction in an online medium also heightens the effect of product brand (Smith et al. 2001). What we can derive from this field of empirical research is that brand is a good proxy attribute that a consumer could use to simplify the decision difficulty. However, even in the presence of Comparison-Shopping websites (e.g., MySimon.com) that screen and extract only alternatives fulfilling a consumer’s preferences, consumers may still encounter decision difficulty in justifying why one would choose an alternative over the rest. The lack of concrete and convincing justification will heighten the degree of choice conflict. In this regard, this research proposes a way to overcome such information processing difficulties in decision-making, i.e., to manipulate the display of the product assortment (i.e., combination of branded and non-branded alternatives).

### **Conceptual Model and Hypotheses**

This study is going to seek a better understanding on the impact of the size of the alternatives set after the screening stage and the proportion of branded products in the alternatives set on the procurement decision behavior. Figure 1 depicts the research model.



<b>Figure 1. The Research Model</b>
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### ***Alternatives Set Size***

As discussed earlier, information load plays a significant role in determining the decisions made by consumers (Iyenger et al. 2000). Following this line of argument, we posit that a consumer would prefer a small alternatives set size compared to a large alternatives set size. The large alternatives set size would lead to a higher level of decision difficulty, which is brought about by the high levels of information load associated with the large number of alternatives and attributes. Prior researches have indicated that the cognitive cost of evaluating choice alternatives is dependent on the number of alternatives that is to be considered (Shugan 1980). This signifies that a large-sized alternative set would result in a more complex process.

When facing a complex decision-making process, consumers often react in two ways: by avoiding making a decision, or by adopting a coping strategy. In the first approach, consumers will favor the decision of avoiding - making a choice by postponing it or seeking a less painful way out involving no action or no change (Anderson 2003). This is enhanced by the natural phenomenon of decision-makers having the tendency to select options that do not result in any change in the state of the world (i.e., the status quo) or those requiring no action on their part (Ritov et al. 1990). Samuelson and Zeckhauser (1988) showed in an experiment that when comparing a set of identical alternatives (save for the additional option of maintaining the status quo for the treatment group) human beings prefer the status quo option. In addition, results from Tversky and Shafir (1992) indicated that although a decision-maker made a decision when presented with a single option, the number of decision-makers refraining from choosing an option increases markedly with an increase in the number of options available to them.

**H1:** *The preference for a no-choice option compared to making a choice increases with an increase in the alternative set size.*

The second approach is to adopt a coping strategy. Within this approach, much of the related studies anchored on the notion that human beings do have limited cognitive resources and they have a tendency to use them judiciously (Russo et al. 1983). In this light, we can expect consumers to switch to a simple decision-processing strategy by relying on simple heuristics when faced with increased demand in the cognitive effort required to process all the alternatives and attributes (Payne et al. 1993). Following from this argument, a large alternatives set size, with its high cognitive load will result in consumers applying a simple heuristics evaluation strategy. This kind of strategy involves choosing the alternative with the best value in the most important attribute and it entails a process that is mainly attribute-based and selective across attributes but consistent across alternatives (Payne et al. 1993). Brand has increasingly been cited as the most crucial product attribute in online shopping (Smith et al. 2001). Specifically, branded products afford comfort and assurance to consumers through various signaling mechanisms, such as the lowering of perceived risks as well as increasing perceived values. This occurs especially in situations where the consumer lacks the expertise to assess quality (Rao et al. 1988) or when objective quality is too complex to assess (Jiang et al. 2007). As such, brands are often used by consumers during the process of making a selection from a set of available alternatives leading to the situation where branded options are often seen as attractive options. Applying this to our context, brand is often seen as an “information chunk” (Olson 1976) as well as an attribute that eases the cognitive effort required to make a decision (Bouch et al. 1987; Hong et al. 2004). Therefore, it is likely that with increasing cognitive load, consumers will use a brand name as a proxy of good choice. Hence, we posit:

**H2:** *The preference for a branded option compared to the choice of a non-branded option increases with an increase in the alternatives set size.*

### ***Proportion of Branded Products***

In our view, an increase in the proportion of branded products can be viewed as equivalent to an increase in the number of attractive products (with highly similar qualities) considered. As a result, the consumer is likely to experience higher conflict while evaluating the products (Nadkarni et al. 2007). In particular, a consumer may experience post-choice discomfort as the result of focusing on the alternatives given up during the selection (Carmon et al. 2003) and the magnitude of discomfort is directly related to the number of alternatives given up. We mentioned earlier that branded products are usually the attractive products and thus, the number of alternatives considered is likely to be the number of branded products available. It means that the number of alternatives given

up during selection is dependent on the number of branded products available. In addition, the lost aversion principle states that the utility function is asymmetrical with respect to gains and losses. Losses tend to be exaggerated to corresponding gains, which could further amplify the level of discomfort felt (Tversky et al. 1991). Consequently, the consumer is likely to preserve the status quo and refrain from making a choice. This proposition is further empirically supported by Dhar (1997) who showed that the addition of another alternative that is relatively equal in attractiveness to the other alternatives increases the preference for a no-choice option.

**H3:** *The preference for a no-choice option compared to the preference for making a choice increases with an increase in the proportion of branded options.*

Although some prior researches have argued that the addition of an alternative cannot increase the choice share of an original alternative, more recent research has shown otherwise. Additional alternatives could indeed increase a particular brand's share and this increase is often known as the attraction effect (Huber et al. 1982). According to the attraction effect, one would expect that the addition of branded products would result in non-branded products being viewed more negatively, leading to less purchasing of non-branded products. However, we propose a counter-intuitive argument that an increase in branded products will result in higher purchase of non-branded products. This is due to the enlargement of the alternatives set from which consumers make comparisons. The additional comparison between the branded options would result in each branded option becoming less attractive (Brenner et al. 1999). At this point, consumers could resort to making their selection from the non-branded products as that would require fewer comparisons and be cognitively easier to manage. In addition, consumers might feel justified in making selection from the non-branded alternatives from having given up fewer alternatives (within the non-branded set) when making a choice. This can also be explained through attribute reversal in which consumers switch from using brand as the key attribute in price comparison.

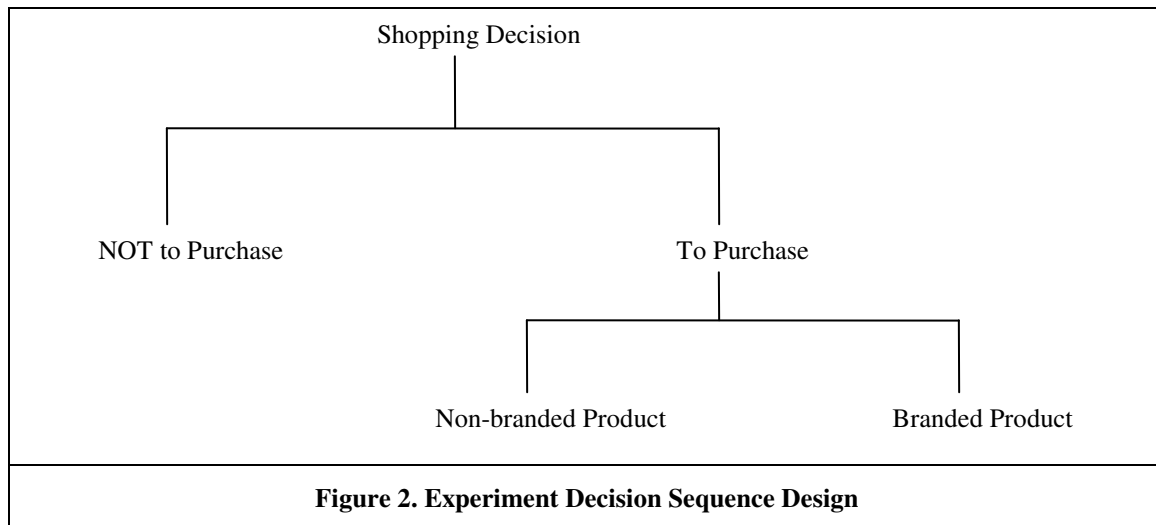
**H4:** *The preference for a non-branded option compared to the choice of a branded option increases with an increase in the proportion of branded options.*

## Research Methodology

This study employs a full 2×2 factorial experimental design to investigate the effects of varying the alternatives set size and proportion of branded products on procurement decision behavior. The experimental manipulations consisted of two levels of alternatives set size (large and small) and two levels of branded proportion (large and small). Alternatives set size is manipulated as 7 (small) products and 21 (large) while branded proportion is manipulated as 20% (small) and 80% (large).

Alternatives set size is manipulated as large and small conditions. In the small condition, seven products are returned. This is due to the processing capability of human beings. According to cognitive psychology, the human being's processing capacity of the short-term memory is approximately seven chunks of information (Miller 1956). In the large condition, 14 products ought to be cognitively overwhelming for a consumer. In the experiment, the number of alternatives returned is 21. This number of products is chosen as Comparison-Shopping websites usually display approximately 20 products on a single web page.

Likewise, the proportion of branded products is manipulated as large and small. For the large condition, 80% of the products listed are branded while 20% of the products are non-branded, and vice versa for the small condition. In fact, 80% is chosen as the cut-off proportion for a large condition to ensure that the number of products belonging to the 80% of the product list will be at least 4 times as much as those belonging to the 20%. The branded products chosen are those that will cause the participants to be likely to display brand awareness, which is the rudimentary level of brand knowledge involving at least recognition of the brand name (Hoyer et al. 1990), towards them. The names of non-branded products are made up to ensure that the participants will not have heard of the brand names.



The main dependent variable used in this research is the choice that a participant has made. The measures are “No Choice”, “Branded Product” or “Non-Branded Product”. To further supplement the choice observation, we included the time spent making a decision as an objective measure. This is used to reflect the level of difficulty as well as the extent of processing expended by the participant in coming to a decision. The time spent in making a decision is measured in seconds and the measurement starts the moment the participant obtains the list of products and ends the moment the participant makes a decision on whether or not to make a purchase.

A simulated Comparison-Shopping website has been developed and the experiment is conducted in a laboratory with undergraduate students. The participants are primed to shop at the Comparison-Shopping website for four electronic products: an MP3 player, a portable DVD player, a digital camera and a laptop.

### ***Experiment Procedure***

We recruited 92 undergraduate students from a public university in the Asia-Pacific region to participate in this between-subject experiment. The participants were recruited by electronic mail and were informed of the time and venue of the experiment. They turned up and performed the experiment at their allocated timeslots and venue. The whole experiment was carried out in four days, with each participant receiving a cash incentive of \$5.

Each experimental session was conducted in the following sequence. Upon arrival, the participants were assigned randomly to a personal computer and provided with an experimental handout. Subsequently, they were informed that they were to take part in a decision-making task at an online marketplace. The participants were asked to read the instructions found in the experimental handout and then were briefed on the procurement tasks. Instructions to avoid any communication with each other during the experiment via any mode of communication were issued to participants. Before shopping for their first product, the participants participated in a background survey through a web-based system to provide personal demographic information. Next, the participants went through a cycle where each of the four mentioned products was purchased. To minimize ambiguity in interpreting product attributes, descriptions and value levels of the attributes were provided in the experimental handout for easy reference. After completing the four purchase tasks, the system prompted the participants to provide feedback relating to manipulation check questions on alternatives set size and the proportion of branded options. Upon completion of the whole experiment, the participants were debriefed and cash payment was made. The participants were explicitly instructed to avoid discussion of the experiment with others and to further minimize the impact of participants sharing their experiences.

As our experiment involved the idea of branding which might be sensitive across racial and cultural lines, we conducted a pre-test on 16 participants in order to obtain brands of products that were considered branded by the population. The pre-test involved the use of a survey in which the participants were asked to indicate their definitions of branded products as well as to indicate from a list of products, which brand names they deemed to be branded. All products in the list were extracted from real Business-to-Consumer websites. The results were collected

and the products were ranked according to the number of participants indicating that a particular product option was considered to be branded. The highly ranked brands were then used in the actual experiment. In order to ensure that the manipulation of non-branded product options was successful, the brand names used in the actual experiment to represent non-branded product options were made up and underwent prior testing on participants to ensure that they had not been heard of before. We also manipulated the number of product attributes and the attribute attractiveness to consumers to ensure all products (regardless of whether they were branded) possessed similar attractiveness to participants.

## Data Analysis and Results

Table 1 summarizes the demographic information of the participants of the experiment. To minimize the influence of the extraneous motivation factors, such as the lack of a need to purchase the product (e.g., “no interest in the product”) and strong predetermined preference for a product (e.g., some students commented that they were only interested in an Apple Mac laptop), participants indicating such factors were removed from the data set. In total, the data of 19 participants’ was removed, leaving the data of 73 participants, with four product choices each. All statistical tests were assessed at the 5% significance level.

<b>Table 1. Demographic Information</b>			
<b>Measure</b>	<b>Items</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Gender	Male	33	45.2%
	Female	40	54.8%
Age	19-20	12	16.4%
	21-22	25	34.2%
	23-24	30	41.1%
	25-26	6	8.3%
Internet Usage Experience	Rarely	3	4.1%
	1-2 times a month	0	0.0%
	1-2 times a week	0	0.0%
	Once a day	9	12.3%
	Several times a day	61	83.6%
Online Shopping Experience	Poor (1 to 2)	10	13.7%
	Modest (3 to 5)	58	79.5%
	Expert (6 to 7)	5	6.8%
Computer Proficiency	Poor (1 to 2)	1	1.4%
	Modest (3 to 5)	40	54.8%
	Expert (6 to 7)	32	43.8%

### Manipulation Check

A manipulation check on the two independent variables was also conducted. Two questions were asked concerning manipulation of the alternatives set size as well as the proportion of branded products. Participants in the small alternatives set size condition reported a significantly lower score of 2.56 compared to participants in the large alternatives set size condition with a score of 4.46 ( $t=13.028$ ,  $p<.01$ ). Similarly, participants in the low proportion of branded options condition indicated a significantly lower score of 2.69 compared to participants in the high proportion of branded options condition with a score of 4.35 ( $t=8.903$ ,  $p<.01$ ). Based on this result, we deemed our manipulation of the two independent variables to be successful.

### Hypotheses Testing

The effects of the manipulated variables on decisional choice (i.e., not to buy, choice for non-branded product, and choice for branded product) were examined using a nested logit model on the overall choice model (i.e., no choice, choice for non-branded product and choice for branded product) and a conditional logit model on the choice for product (i.e., non-branded product and branded product). The results show that by clustering the choice for non-



branded and branded products, the nested logit model overcomes the independence from the irrelevant alternatives problem when alternatives that were similar within a group were analyzed (i.e., to purchase) but which were different from other groups (i.e., not to purchase). In our analysis, we assume the buyer decision process to consist of choices to be made from the available alternatives in two stages: (1) whether to buy or not to buy, and (2) whether to purchase a non-branded or branded product.

We regressed the dependent variables, i.e., choice made on two independent variables, alternatives set size (0 – small; 1 – large) and proportion of branded options (0 – small; 1 – large), to decisional choice (0 – not to buy; 1 – choice for non-branded product; 2 – choice for branded product) as well as on product knowledge, product type, and preference for brand over price as control variables. The results suggest that the effect of the alternatives set size is not significantly related to the decision to purchase. However, participants are more likely not to buy than to buy if the proportion of branded option increases. Hence, H1 is not supported, while H3 is supported.

<b>Table 2. Frequency Distribution of Choices Made</b>				
<b>Alternatives set size</b>	<b>Proportion of branded products</b>	<b>Choice</b>		
		<b>No-choice</b>	<b>Non-branded</b>	<b>Branded</b>
Large	High	9 (11.8%)	6 (7.9%)	61 (80.3%)
	Low	11 (15.3%)	28 (38.9%)	33 (45.8%)
	Total	20 (13.5%)	34 (23.0%)	94 (63.5%)
Small	High	9 (12.5%)	22 (30.6%)	41 (56.9%)
	Low	19 (26.4%)	35 (48.6%)	18 (25.0%)
	Total	28 (19.4%)	57 (39.6%)	59 (41.0%)
<b>Proportion of Branded Products</b>				
Large		18 (12.2%)	28 (18.9%)	102 (68.9%)
Small		30 (20.8%)	63 (43.8%)	51 (35.4%)

To further investigate the choice between non-branded (i.e., focus on non-brand attribute) and branded products (i.e., focused on brand attribute), we constructed a conditional logit model with alternatives set size and proportion of branded options as independent variables as well as product type, product knowledge and preference for brand over price as control variables (see Table 4). The results indicate that participants are more likely to choose a non-branded product than one that is branded if the alternatives set size and proportion of branded products increases. Hence, H2 is not supported, while H4 is supported.

<b>Table 3. Nested Logit Model of Purchase Choice (i.e. No Choice versus Choice)</b>			
<i>Variable name</i>	<i>Estimate</i>	<i>Standard error</i>	<i>Z</i>
<b>Independent variables</b>			
Alternatives set size	-.341	.236	-1.45
Proportion of branded options	-.479**	.237	-2.02
<b>Control variables</b>			
Product type	.274*	.148	1.85
Product knowledge	-.019	.122	-.15
Preference for brand over price	.188	.128	1.47
<b>Auxiliary statistics</b>		<b>At convergence</b>	
Log likelihood		-285.906	
LR chi-square		69.777***	

<b>Table 4. Conditional Logit Model of Option Choice (i.e. Non-Branded versus Branded)</b>			
<i>Variable name</i>	<i>Estimate</i>	<i>Standard error</i>	<i>Z</i>
<b>Independent variables</b>			
Alternatives set size	-1.091***	.332	-3.29
Proportion of branded options	-1.712***	.335	-5.11
<b>Control variables</b>			

Product type	-.236	.149	-1.58
Product knowledge	-.454***	.128	-3.55
Preference for brand over price	-.625***	.144	-4.35
<b>Auxiliary statistics</b>		<b>At convergence</b>	
Log likelihood		-117.638	
LR chi-square		102.98***	

## Discussion and Implications

### *Discussion of Results*

In this study, we examined the influence of alternatives set size and the proportion of branded alternatives on consumer choice. Specifically, we investigated the effects of (1) increasing the number of products available and (2) increasing the proportion of branded products on choice. Results indicated that, contrary to our prediction, an increase in alternatives set size did not have a significant influence on the number of participants refraining from making a choice. In addition, the increase in alternatives set size resulted in more participants purchasing a non-branded option as opposed to a branded option as we hypothesized earlier. However, we observed that participant decisions are influenced by the proportion of branded products available to them. Participants are more likely to refrain from purchasing a product when faced with an increase in the number of branded options available to them. Under these conditions, when consumers do purchase a product, they are more likely to purchase a non-branded product.

Furthermore, our results indicate that the number of products available to consumers does not influence their decision. This observation appears to be in stark contrast to past research on cognitive load and how it affects choice. Particularly, prior researches, such as those of Iyengar and Lepper (2000), and Tversky and Shafir (1992), observed that as the number of options increases, consumers are more likely to refrain from making a choice. In addition, we would have expected branded products to be chosen as brand has been thought of as being a surrogate attribute of quality (Sullivan 1998) which could reduce the cognitive effort required (Bouch et al. 1987). We believe that there could be two possible reasons leading to the conflicting results.

First, prior research has only examined two attributes, i.e., price and brand. Participants of past experiments could have refrained from making any choices even though the number of products had increased, as they felt that the information presented was not inadequate. In our experiment, there were seven attributes (inclusive of price and brand) available to the participants. We conceive that participants could concentrate on some attributes that were important to them in the online shopping context. Thus they had more options irrespective of the number of products available to them.

The second reason could be the nature of the experiment itself. Prior research involved field experiments dealing with the selection of jams, chocolates or even essays (Iyengar et al. 2000) that did not provide additional aids to reduce the level of difficulty participants could face in making a choice. Our experiment, which focuses on Comparison-Shopping websites, injects realism by providing participants with the ability to sort the products according to product attributes. This might have enabled participants to mitigate the cognitive effort required to process larger lists of product options (Haubl et al. 2000).

Further analysis on the data collected indicated that an increase in the number of products corresponds to an increase in the time required to develop a decision. The time taken for a large alternatives set size was 223.68 seconds while the time taken for a small alternatives set size was 177.38 seconds (Table 5a). Considering that H1 and H2 were not supported, this result is particularly interesting as it indicates that although there is a significant difference in the time spent on developing a decision, it does not necessarily cause a symmetric effect on the decision made. Probing further, we also observe that participants who selected branded products took a shorter time (181.49 seconds) than participants who selected non-branded products (228.65 seconds) (See Table 5b). This appears to be logical, as one participant could have stratified by choosing a branded product, while those choosing the non-branded options would have faced decision difficulty in selecting among the branded products and/or to convince them to abandon the choice for branded options.

**Table 5a. Influence on Time Spent on Making a Decision**

		Mean (std deviation)	t-test	Mann-Whitney U test
Alternatives set size	Small	177.380 (123.130)	T = 3.134, p < .01	z = -3.589, p < .01
	Large	223.680 (129.270)		
Proportion of branded options	Small	198.030 (134.334)	T = .370, p > .10	z = -.721, p > .10
	Large	203.590 (122.285)		

**Table 5b. Time Spent on Making a Decision**

No-choice	Non-Branded	Branded	ANOVA
209.85 (124.242)	228.65 (143.354)	181.490 (116.822)	F = 4.089, p < .05

### ***Limitations and Future Research***

There are three primary limitations in our research. First, as mentioned previously, this experiment involved a laboratory experiment under conditions that might have led to the results we obtained. In order to overcome this limitation, future researchers might wish to explore the use of unobtrusive measures, such as tracking click-streams of real-life consumers at Comparison-Shopping websites in order to obtain a clearer perspective of how alternatives set size and the proportion of branded products could affect consumer choice. Second, as our participants are drawn from the student population, they might not be totally representative of the user group that frequents Comparison-Shopping websites. Our participants might have different levels of product knowledge, computer proficiency and purchasing power when compared to consumers making use of Comparison-Shopping websites. Consequently, our results might not be applicable to the entire population. In order to overcome this limitation, future studies could either recruit from a wider subject pool or attempt to recruit participants that use Comparison-Shopping websites frequently. Third, our choice of product categories consisting solely of electronic products is also a likely limiting factor as Comparison-Shopping websites aggregate information for other products such as books. Thus, future research could include other types of products that are found at Comparison-Shopping websites in order to obtain a deeper understanding of the influence of alternatives set size and the proportion of branded options on different products. In addition, as this study focuses on the effects of the local contrast effect on product choice through varying the proportion of branded products, future research could involve examination of the background contrast effect on product choice in cases where brand proportion differs within an experiment.

### ***Theoretical Contributions***

Past research has suggested that when faced with a decision environment in which choice is difficult due to the high information load that has to be processed, human beings tend to act as “cognitive misers”, seeking to minimize the effort expended in coping with a decision task (Russo et al. 1983). In this aspect, human beings tend to favor outcomes that do not require any action on their part (Ritov et al. 1990) or to employ the use of simple heuristics that are selective of the information used (Tetlock et al. 1996). Our study is different from prior studies as we argue that the thrust of decision difficulty resides in the alternatives set composition rather than the size of the alternatives set available. This is because consumers are more likely to focus on a subset of options that they perceive to be likely candidates for procurement. Results have provided evidence to support our supposition by suggesting a significant influence of choice composition on consumer choice. Prior research has shown that contextual stimuli are responsible for attract effects (Huber et al. 1983), asymmetric dominance effects, trade-off contrast effects (Simonson et al. 1992), and compromise effects (Simonson 1989). This research adds a new dimension by explicitly considering the influence of brand and brand composition on consumer decisions.

In addition, the concept of whether brands do continue to play a part in the online market has been an indistinct concept that has been a point of contention over the years. Our research suggests that branded products could still have an important role to play, albeit in increasing the attractiveness of non-branded products at their own expense. Prior research has articulated that context could affect the internal standards from which alternatives are evaluated, which in turn influences the attractiveness of an alternative (Tversky et al. 1992). Our research has supported this

proposition by suggesting that as the proportion of branded products increases, consumers find it difficult to justify a selection from the branded alternatives, opting rather to select a non-branded alternative.

Through this research, we have also added to the literature on the brand name being used by consumers as an “information chunk” representing a composition of product attributes (Olson 1976). Prior research that uses a few attributes to describe a product (mainly using price and brand) has shown a reliance on brand name being used as the selection criteria. Our research which makes use of 6 different attributes (excluding brand name) to describe a product appears to have lessened consumer’s reliance on brand name as the selection criteria. Consequently, we can perceive that as more tangible attributes are available for evaluation, the use of the brand attribute as a surrogate attribute for product superiority might be undermined. Conversely, when there are insufficient attributes available to the consumer, the brand name would represent the attribute that is not available.

### ***Practical Contributions***

As online marketplaces become increasingly competitive and more companies transfer their product sales to the online domain, the increasing number of Comparison-Shopping websites available has been a source of concern to these companies. They are particularly interested in how these websites could have an impact on their sales. Product sales could be affected by the relative ease with which consumers could make comparisons as well as the relative attractiveness of the products displayed (due to product composition). This study has several practical implications on companies. Indeed, companies that produce non-branded products could take comfort in the fact that despite being placed with branded products in the online market, they are still able to generate sales. Research on online price dispersion provides further support for this conjecture (Brynjolfsson et al. 2000).

In addition, our results show that as the proportion of branded products increases, the sales of non-branded products also increases. Hence companies should be selective of where they list their products in order to gain an advantage. Producers of branded products also ought to be selective of where they list their products too. Besides, as it is the relative attractiveness of the branded products that leads consumers to turn to non-branded options, such companies should seek to differentiate themselves from companies marketing other branded products. In addition, companies should not be overly concerned about the influence of the alternatives set size on their sales as the sorting features offered by the Comparison-Shopping websites are likely to level out the differences.

### **Conclusion**

This study has examined the issue of how the alternatives set size and proportion of branded products could affect decision-making performance in the context of Comparison-Shopping websites. Through careful conceptualizations of the interactions between alternatives set sizes and the proportion of branded products, this study has extended existing literature on how Comparison-Shopping websites could affect decision-making. The results suggest that an increase in the proportion of branded products leads to more consumers taking up a status quo option. Alternatively, consumers would favor a non-branded option over one that is branded. Our results do not show any negative influence of the alternative set size on decisions made. Thus, we perceive that decision choice is more likely to be dependent on the composition of the alternatives set than on size; and that further research on how such a composition could affect choice, should be conducted.

### **References**

- Anderson, C. J. 2003. “The Psychology of Doing Nothing: Forms of Decision Avoidance Result From Reason and Emotion,” *Psychological Bulletin* (129:1), pp. 139-167.
- Bogart, L. and Lehman, C. 1973. “What Makes a Brand Name Familiar?” *Journal of Marketing Research*, pp. 17-22.
- Bouch, D., Shipp, S., Loken, B., Genturk, E., Crockett, S., Kennedy, E., Minshall, B., Misurell, D., Rochford, L. and Strobel, J. 1987. “Affect Generalization to Similar and Dissimilar Brand Extensions,” *Psychology and Marketing* (4:3), pp. 225-237.
- Brehem, J. W. 1972. *Response to the Loss of Freedom: A Theory of Psychological Reactance*, General Learning Press, Morristown, NJ.
- Brenner, L., Rottenstreich, Y. S. and Sood, S. 1999. “Comparison, Grouping, and Preference,” *Psychological Science* (10:3), pp. 225-229.

- Brynjolfsson, E., Smith, M.D. 2000. "Frictionless Commerce? A Comparison of Internet and Conventional Retailers," *Management Science* (46:4), pp. 563-585.
- Browne, G. J., Pitts, M. G., and Wetherbe, J. C. 2007. "Cognitive Stopping Rules for Terminating Information Search in Online Tasks," *MIS Quarterly* (31:1), pp. 89-106.
- Carmon, Z., Wertenbroch, K. and Zeelenberg, M. 2003. "Option Attachment: When Deliberating Makes Choosing Feel Like Losing," *Journal of Consumer Research*, pp. 15-29.
- Chernev, A. 2003. "When More is Less and Less is More: The Role of Ideal Point Availability and Assortment in Consumer Choice," *Journal of Consumer Research* (30), pp. 170-183.
- Chakravarti, A., Janiszewski, C. and Ulkumen, G. 2006. "The Neglect of Prescreening Information," *Journal of Marketing Research*, pp. 642-653.
- Degeratu, A., Rangaswamy, A. and Wu, J. 2000. "Consumer Choice Behavior in Online and Traditional Supermarkets: The Effects of Brand Name, Price, and other Search Attributes," *International Journal of Research in Marketing* (17:1), pp. 55-78.
- Dhar, R. 1997. "Consumer Preference for a No-Choice Option," *Journal of Consumer Research*, (24), pp. 215 -231.
- East, R., Hammond, K. and Lomax, W. 2008. "Measuring Impact of Positive and Negative Word of Mouth on Brand Purchase Probability," *International Journal of Research in Marketing* (25), pp. 215-224.
- Jiang, Z., Benbasat, I. 2007. "The Effects of Presentation Formats and Task Complexity on Online Consumers' Product Understanding," *MIS Quarterly* (31:3), pp. 475-500.
- Haubl, G. and Trifts, V. 2000. "Consumer Decision Making in Online Shopping Environments: The Effects of Interactive Decision Aids," *Marketing Science* (19:1), pp. 4-21.
- Hoyer, W. D and Brown, S.P. 1990. "Effects of Brand Awareness on Choice for a Common, Repeat-Purchase Product," *Journal of Consumer Research* (17), pp. 141-148.
- Huber, J., Payne, J.W. and Puto, C. 1982. "Adding Asymmetrically Dominated Alternatives: Violations of Regularity and the Similarity Hypothesis," *Journal of Consumer Research* (9), pp. 90-98.
- Hess, T. J., Fuller, M. A., Mathew, J. 2005. "Involvement and Decision-Making Performance with a Decision Aid: The Influence of Social Multimedia, Gender and Playfulness," *Journal of Management Information Systems* (22:3), pp. 15-54.
- Hong, W., Thong, J. Y. L., and Tam, K. Y. 2004. "Designing Product Listing Pages on E-Commerce Websites: An Examination of Presentation Mode and Information Format," *International Journal of Human-Computer Studies* (61:4), pp. 481-503.
- Iyengar, S. S. and Lepper, M. 2000. "When Choice is Demotivating: Can One Desire Too Much of a Good Thing?" *Journal of Personality and Social Psychology* (76), pp. 995-1006.
- Kahn, B., Moore, W.L. and Glazer, R. 1987. "Experiments in Constrained Choice," *Journal of Consumer Research* (14), pp. 96-113.
- Kleinmuntz, D. N. and Schkade, D. A. 1993. "Information Displays and Decision Processes," *Psychological Science* (4:4), pp. 221-227.
- Kotler, P. 1997. *Marketing Management*, 7th., Prentice-Hall, Englewood Cliffs, NJ.
- Lancaster, K. 1990. "The Economics of Product Variety: A Survey," *Marketing Science* (9:3), pp. 189-206.
- Miller, G. A. 1956. "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information," *Psychological Review* (63), pp. 81-97.
- Nadkarni, S., Gupta, R. 2007. "A Task-Based Model of Perceived Website Complexity," *MIS Quarterly* (31:3), pp. 501-526.
- Olson, J. C. 1976. Price as an informational Cue: Effects on product Evaluations. Working Series in Marketing Research, College of Business Administration, The Pennsylvania State University, Paper No.43.
- Payne, J. W., Bettman, J. R., and Johnson, E. J. 1993. *The Adaptive Decision Maker*, Cambridge University Press.
- Rao, A. R. and Monroe, K. B. 1988. "The Moderating Effect of Prior Knowledge on Cue Utilization in Product Evaluations," *Journal of Consumer Research* (15:2), pp. 253-264.
- Redmond, W. H. 2002. "The Potential Impact of Artificial Shopping Agents in E-Commerce Markets," *Journal of Interactive Marketing* (16:1), pp. 56-66.
- Ritov, I. and Baron, J. 1990. "Reluctance to Vaccinate: Omission Bias and Ambiguity," *Journal of Behavioral Decision*, pp. 263-273.
- Russo, J.E. and Doshier, D.A. 1983. "Strategies for Multiattribute Binary Choice," *Journal of Experimental Psychology*, pp. 676-696.
- Samuelson, W. F. and Zeckhauser, R. 1988. "Status Quo Bias in Decision Making," *Journal Risk and Uncertainty*, pp. 7-59.
- Shugan, S. M. 1980. "The Cost of Thinking," *Journal of Consumer Research* (7), pp. 99-111.

- Simonson, I. 1989. "Choice Based on Reasons: The Case of Attraction and Compromise Effects," *Journal of Consumer Research* (16), pp. 158-174.
- Simonson, I. and Tversky, A. 1992. "Choice in Context: Tradeoff Contrast and Extremeness Aversion," *Journal of Marketing Research* (29), pp. 281-295.
- Sismeiro, C. and Bucklin, R.E. 2004. "Modeling Purchase Behavior at an E-Commerce Web Site: A Task-Completion Approach," *Journal of Marketing Research* (41), pp. 306-323.
- Smith, M.D. and Brynjolfsson, E. 2001. "Customer Decision Making at an Internet Shopbot: Brand Still Matters," *The Journal of Industrial Economics* (49:4), pp. 541-558.
- Sullivan, M. W. 1998. "How Brand Names Affect the Demand for Twin Automobiles," *Journal of Marketing Research* (35:2), pp. 154-165.
- Tan, C. H. 2003. "Comparison-Shopping Websites: An Empirical Investigation on the Influence of Decision Aids and Information Load on Consumer Decision-Making Behavior," in *Proceedings of 24th International Conference in Information Systems*, Seattle, United States, pp. 1-14.
- Tetlock, P., Peterson, R.S. and Lerner, J.S. 1996. Revising the Value Pluralism Model: Incorporating Social Context and Context Postulates, *The Psychology of Values: The Ontario Symposium on Personality and Social Psychology*, Vol. 8, ed. Clive Sleigman, James M. Olson, and Mark p. Zanna, Mahwah, NJ: Erlbaum, pp. 25-51.
- Tversky A. and Kahneman, D. 1991. "Loss Aversion in Riskless Choice: A Reference-Dependent Model," *Quarterly Journal of Economics* (106), pp. 1039-1061.
- Tversky, A. and Shafir, E. 1992. "Choice under Conflict: The Dynamics of Deferred Decisions," *Psychological Science* (6), pp. 358-361.